

CLAIMS

1. An electrical distribution device comprising an input for connection of an incoming
5 electrical line, electrical protection means connected to the input and comprising electrical
distribution feeders designed to supply electrical loads,
said protection means comprising:
- a main part comprising main breaking means connected to the input for connecting the
incoming electrical line, and main control means for controlling opening and closing of the
10 main breaking means,
- an electrical power distribution line connected to the main breaking means of the main
part, and
- at least one secondary part separated from the main part and comprising at least one
secondary breaking device and secondary control means to command opening and closing
15 of at least one secondary breaking device, said at least one secondary breaking device
being connected to said distribution line and to at least one electrical distribution feeder,
the secondary control means enabling opening of at least one secondary breaking device if
a current flowing in said breaking device is lower than a preset opening current threshold.
- 20 2. The distribution device according to claim 1 wherein the main control means
comprise first detection means for detecting a main fault current and first control means
commanding opening of the main breaking means during a preset first time, said first

detection means detecting a main fault when a first main fault current threshold is exceeded by a signal representative of a current flowing in the main breaking means.

3. The distribution device according to claim 2 wherein the first control means
5 command opening of the main breaking means after a time delay having a preset second duration and subsequent to detection of a main fault.

4. The distribution device according to claim 2 wherein the maximum value of the
10 preset first time delay is ten milliseconds.

5. The distribution device according to claim 1 wherein the main part comprises a tie
breaker connected to the input for connecting an incoming electrical line and connected in
series with the main breaking means.

15 6. The distribution device according to claim 1 wherein the main breaking means are
breaking means with power semi-conductors.

7. The distribution device according to claim 1 wherein the secondary control means
comprise second detection means for detecting a secondary fault current flowing in at least
20 one secondary breaking device, and second control means commanding opening of said at
least one secondary breaking device if a secondary fault has been detected and if a current
flowing in said breaking device is lower than the preset opening current threshold, said
second detection means detecting a secondary fault when a second secondary fault

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threshold is exceeded by a signal representative of a current flowing in said at least one secondary breaking device.

8. The distribution device according to claim 7 wherein the second detection means for
5 detecting a secondary fault current flowing in at least one secondary breaking device
comprise means for detecting a polar fault corresponding to at least one current flowing in
at least one conductor of said at least one secondary breaking device.

9. The distribution device according to claim 7 wherein the second detection means for
10 detecting a secondary fault current flowing in at least one secondary breaking device
comprise means for detecting a ground fault current flowing in at least two conductors of
said at least one secondary breaking device.

10. The distribution device according to claim 1 wherein at least one secondary
15 breaking device is an electromagnetic relay.

11. The distribution device according to claim 1 wherein at least one secondary
breaking device comprises a breaking device with electronic power components.

20 12. The distribution device according to claim 1 comprising a communication line and
wherein at least one secondary part comprises secondary control means comprising
communication means connected to the communication line, said communication means
being able to receive closing information to close at least one secondary breaking device.

13. The distribution device according to claim 12 comprising a central unit connected to the communication line to receive status information and to command opening and/or closing of at least one secondary breaking device.

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14. The distribution device according to claim 12 wherein the primary control means comprise communication means connected to the communication line to receive control signals.

10 15. The distribution device according to claim 14 wherein secondary control means send a priority signal with different characteristics from an information communication signal on the communication line to command opening of the main breaking means when an electrical fault is detected in a feeder supplied by a secondary breaking device and to command closing of the main breaking means when opening of a secondary breaking
15 device has been commanded following a fault, the primary control means comprising means for detecting said priority signal and for commanding opening and closing of the main breaking means according to the presence of said priority signal.

20 16. The distribution device according to claim 1 wherein at least one secondary part is arranged in a building electrical distribution or connection box.

17. The distribution device according to claim 1 wherein at least one secondary part is arranged in a building automation communication module, the secondary control means of

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said secondary part comprising electrical protection functions and communication and automatic control functions to command secondary breaking devices.

18. The distribution device according to claim 12 wherein an electrical power
5 distribution line comprising at least two conductors, a communication line comprising at least two conductors, and an electrical earth or ground line comprising at least one conductor are arranged in a flat cable comprising at least five conductors.

19. An electrical installation comprising an incoming electrical line, an electrical
10 distribution device connected to the incoming electrical line, and distribution lines connected between the electrical distribution device and electrical apparatuses or loads, wherein the distribution device is a distribution device according to claim 1 having a main part connected to the incoming electrical line and at least one secondary part connected to distribution lines.

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20. An electrical protection process for an electrical distribution device comprising:

- a first step of detection of an electrical fault in main breaking means,
- a second step of detection of an electrical fault in secondary breaking means connected by a distribution line to the main breaking means,

20 - a time delay step,
- an opening step of the main breaking means,

- an opening step of the secondary breaking means when a current flowing in these means is lower than a preset opening current threshold value following detection of a fault at the second detection step,
- a first closing step of the main breaking means after a preset time delay.

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21. The electrical protection process according to claim 20 comprising:

- a second opening step of the main breaking means commanded by transmission of a priority opening command signal on a communication line connected between secondary breaking means and the main breaking means, said priority signal being transmitted when a fault current flowing in a secondary breaking device is detected,
- a second closing step of the main breaking means after an end of transmission of said priority signal step.

22. An electrical protection process for an electrical distribution device comprising:

- a first step of detection of an electrical fault in secondary breaking means connected by a distribution line and a communication line to main breaking means,
- a step of beginning of transmission of a priority opening command signal on said communication line to command opening of the main breaking means,
- a first step of opening of the main breaking means commanded by transmission of said priority opening command signal on said communication line,
- a second step of opening of the secondary breaking means when a current flowing in these means is lower than a preset opening current threshold value following detection of a fault at the first detection step,

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- a step of end of transmission of the priority opening command signal,
- a step of closing of the main breaking means after the end of transmission of the priority opening command signal step.